

What is claimed is:

1. A method of preparing a recommendation to be accessed by a user comprising the steps of:

providing a sparse ratings matrix;

forming a plurality of data structures representing said sparse ratings matrix;

5 forming a runtime recommendation model from said plurality of data structures;

determining a recommendation from said runtime recommendation model in response to a request from a user; and

providing said recommendation to said user.

10 2. The method of claim 1 further comprising calculating a unary multiplicity voting recommendation from said runtime recommendation model.

3. The method of claim 1 further comprising calculating a non-unary multiplicity voting recommendation from said runtime recommendation model.

15 4. The method of claim 2 wherein said set step of calculating a unary multiplicity voting recommendation comprises calculating an anonymous recommendation.

5. The method of claim 2 wherein said set step of calculating a unary multiplicity voting recommendation comprises calculating a personalized recommendation.

5 6. The method of claim 3 wherein said set step of calculating a non-unary multiplicity voting recommendation comprises calculating an anonymous recommendation.

10 7. The method of claim 3 wherein said set step of calculating a non-unary multiplicity voting recommendation comprises calculating a personalized recommendation.

15 8. The method of claim 1,
 wherein said step of forming a runtime recommendation model from said plurality of data structures comprises:

 mapping said sparse ratings matrix into a plurality of sub-space ratings matrix;

 wherein said mapping step comprises multiplying said ratings matrix by a mappings matrix between said ratings matrix and a plurality of categories; and wherein each of said sub-space ratings matrices corresponds to one of said plurality of categories.

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9. A method of preparing a recommendation to be accessed by a user comprising the steps of:

providing a sparse ratings matrix;

banding said sparse ratings matrix;

5 distributing said banded sparse ratings matrix to a plurality of computing nodes,

wherein each of said computing nodes generates an output;

forming a runtime recommendation model from said output of said plurality of computing nodes;

10 determining a recommendation from said runtime recommendation model in response to a request from a user; and

providing said recommendation to said user.

10. A method of preparing a recommendation to be accessed by a user comprising the steps of:

providing a sparse ratings matrix;

striping said sparse ratings matrix;;

5 distributing said striped sparse ratings matrix to a plurality of computing nodes,

wherein each of said computing nodes generates an output;

forming a runtime recommendation model from said output of said plurality of computing nodes;

10 forming a runtime recommendation model from said plurality of sub-space ratings matrix;

determining a recommendation from said runtime recommendation model in response to a request from a user; and

providing said recommendation to said user.

11. A method of preparing a recommendation to be accessed by a user comprising the steps of:

providing a sparse ratings matrix;

providing an update ratings data structure;

5 forming a plurality of data structures representing said sparse ratings matrix;

forming a runtime recommendation model from said plurality of data structures and said update ratings data structure;

determining a recommendation from said runtime recommendation model in response to a request from a user; and

10 providing said recommendation to said user.

12. The method of claim 11 further comprising calculating a unary multiplicity voting recommendation from said runtime recommendation model.

15 13. The method of claim 11 further comprising calculating a non-unary multiplicity voting recommendation from said runtime recommendation model.

20 14. The method of claim 12 wherein said set step of calculating a unary multiplicity voting recommendation comprises calculating an anonymous recommendation.

15. The method of claim 12 wherein said set step of calculating a unary multiplicity voting recommendation comprises calculating a personalized recommendation.

5 16. The method of claim 13 wherein said set step of calculating a non-unary multiplicity voting recommendation comprises calculating an anonymous recommendation.

10 17. The method of claim 13 wherein said set step of calculating a non-unary multiplicity voting recommendation comprises calculating a personalized recommendation.

15 18. The method of claim 11, further comprising
mapping said sparse ratings matrix into a plurality of sub-space ratings matrix;
wherein said mapping step comprises multiplying said ratings matrix by a
mappings matrix between said ratings matrix and a plurality of categories; and wherein
each of said sub-space ratings matrices corresponding to one of said plurality of
categories.

19. A method of preparing a recommendation to be accessed by a user comprising the steps of:

providing a sparse ratings matrix;

forming a plurality of data structures representing said sparse ratings matrix;

5 forming a first recommendation model from said plurality of data structures;

perturbing said first recommendation model to generate a runtime recommendation model;

determining a recommendation from said runtime recommendation model in response to a request from a user; and

10 providing said recommendation to said user.

20. The method of claim 19 further comprising calculating a unary multiplicity voting recommendation from said runtime recommendation model.

15 21. The method of claim 19 further comprising calculating a non-unary multiplicity voting recommendation from said runtime recommendation model.

22. The method of claim 20 wherein said set step of calculating a unary multiplicity voting recommendation comprises calculating an anonymous
20 recommendation.

23. The method of claim 20 wherein said set step of calculating a unary multiplicity voting recommendation comprises calculating a personalized recommendation.

5 24. The method of claim 21 wherein said set step of calculating a non-unary multiplicity voting recommendation comprises calculating an anonymous recommendation.

10 25. The method of claim 21 wherein said set step of calculating a non-unary multiplicity voting recommendation comprises calculating a personalized recommendation.

15 26. The method of claim 19, further comprising
mapping said sparse ratings matrix into a plurality of sub-space ratings matrix;
wherein said mapping step comprises multiplying said ratings matrix by a
mappings matrix between said ratings matrix and a plurality of categories; and wherein
each of said sub-space ratings matrices corresponding to one of said plurality of
categories.

27. A method of preparing a recommendation to be accessed by a user comprising the steps of:

providing a sparse ratings matrix;

forming a plurality of data structures representing said sparse ratings matrix;

5 forming a first recommendation model from said plurality of data structures;

truncating said first recommendation model to generate a runtime recommendation model;

determining a recommendation from said runtime recommendation model in response to a request from a user; and

10 providing said recommendation to said user.

28. The method of claim 27 further comprising calculating a unary multiplicity voting recommendation from said runtime recommendation model.

15 29. The method of claim 27 further comprising calculating a non-unary multiplicity voting recommendation from said runtime recommendation model.

20 30. The method of claim 28 wherein said set step of calculating a unary multiplicity voting recommendation comprises calculating an anonymous recommendation.

31. The method of claim 28 wherein said set step of calculating a unary multiplicity voting recommendation comprises calculating a personalized recommendation.

5 32. The method of claim 29 wherein said set step of calculating a non-unary multiplicity voting recommendation comprises calculating an anonymous recommendation.

10 33. The method of claim 29 wherein said set step of calculating a non-unary multiplicity voting recommendation comprises calculating a personalized recommendation.

15 34. The method of claim 27, further comprising
mapping said sparse ratings matrix into a plurality of sub-space ratings matrix;
wherein said mapping step comprises multiplying said ratings matrix by a
mappings matrix between said ratings matrix and a plurality of categories; and wherein
each of said sub-space ratings matrices corresponding to one of said plurality of
categories.

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35. A method of preparing a recommendation to be accessed by a user comprising the steps of:

providing a first ratings matrix;

providing a second ratings matrix;

5 forming a runtime recommendation model from a cross-set of co-occurrences of said first ratings matrix and said second ratings matrix;

calculating a recommendation from said runtime recommendation model in response to a request from a user; and

providing said recommendation to said user.

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